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EXAMINER	
LEITH, PATRICIA A	

ART UNIT	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/749,602	EMERY ET AL.	
	Examiner	Art Unit	
	Patricia Leith	1655	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *2/11/08*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *34-44, 67-69, 71-82 and 84 –102* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *34-44, 67-69, 71-82 and 84 –102* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

. DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 2/11/08 has been entered.

Claims 34-44, 67-69, 71-82, and 84 –102 remain pending in the application and were examined on their merits.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA

1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 34-44 and 67-69 remain rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-14 of U.S. Patent No. US 6,682,754. Although the conflicting claims are not identical, they are not patentably distinct from each other because the Instant claims are made obvious by claims 1-14 of '754.

Claims 1-14 of '754 teach a method for inducing immunity in a bird via implantation in ovo of a biocompatible implant providing for delayed and sustained release of an immunogen, wherein the implant is injected during the fourth quarter of

incubation, during 15-28 days of incubation and day 17-19 of incubation of an egg and wherein the implant provides for sustained release of the immunogen for about 1-90 days or 1-60 days or 1-35 days post-hatching.

The claims of 1-14 do not specifically teach wherein the immunogen is a siderophore receptor such as enterochelin. However, the patent teaches that a preferred immunogen is enterochelin (see col. 10 line 45). Therefore, enterochelin is encompassed by the term 'immunogen'.

This rejection remains pending because Applicant has neither convincingly traversed this rejection, nor has Applicant furnished any terminal disclaimer in order to overcome this rejection.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of

the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 34, 37, 39-43, 67-69, 83-86, 89, 91-95 and 97-102 remain rejected under 35 U.S.C. 103(a) as being unpatentable over Emery et al. (US 5,830,479) in view of Phelps et al. (US 5, 339,766) in view of Genovese et al. (1998) in light of Sharma et al. (US 4458630 A)* for the reasons of record.

It is noted that Applicants have amended claim 34 to read 'in a bird hatching from the egg', a more complete excerpt of the claim reading: '…wherein the implant provides for sustained release of the immunogen until the maternal antibodies in a bird hatching from the egg are reduced so that the bird is capable of mounting an immune response to the immunogen…'

This limitation has already been addressed in previous Office action. The examiner has fully taken into consideration that 'until the maternal antibodies' could

mean a time after the chick had hatched from the egg and has provided ample motivation for such a limitation which will be reiterated *infra.*

Claims 34-44, 67-69, 71-82, and 84 –102 remain rejected under 35 U.S.C. 103(a) as being unpatentable over Emery et al. (US 5,830,479) in view of Phelps et al. (US 5, 339,766) and further in view of Evans et al. (US 6,500,438 B2) in view of Genovese et al. (1998) in light of Sharma et al. (US 4458630 A)*.

It is noted that Applicants have amended claim 34 to read 'in a bird hatching from the egg', a more complete excerpt of the claim reading: '…wherein the implant provides for sustained release of the immunogen until the maternal antibodies in a bird hatching from the egg are reduced so that the bird is capable of mounting an immune response to the immunogen…' This limitation has already been addressed in previous Office action. The examiner has fully taken into consideration that 'until the maternal antibodies' could have meant a time after the chick had hatched from the egg and has provided ample motivation for such a limitation.

Applicant's arguments were fully considered, but were not found persuasive for the reasons set forth *infra.*

Applicants commence by stating a summary of the Invention as well as background thereof (pp. 9-10).

Applicant states that the Examiner indicated in the previous Office action that “an egg contains maternal antigens to the antibodies” and points out that the Examiner rather meant that "the egg contains maternal antibodies to the antigens.” The Examiner acquiesces, this was an inadvertent typographical error.

Applicants give a brief synapses of the teachings of Emery et al. and include the following statement:

> As noted in the background, siderophores had previously not been used as immunogens due to an inability to extract these proteins. Emery et al. do not teach or suggest injecting a biocompatible implant comprising an implant into an egg comprising maternal antibody to the immunogen, wherein the implant provides for sustained release of the immunogen Until the maternal antibodies in a bird hatching from the egg are reduced so that the bird is capable of mounting an immune response to the immunogen (independent claim 1, see also independent claims 69 and 84)

However, Emery et al. taught a biocompatible implant comprising a siderophore receptor protein from a gram-negative bacteria along with sustained-release matrices and *in-ovo* administration of the implant to a bird to elicit an immune response. Emery et al. teaches that preferred sustained delivery systems were taught by a patent to Kent : US 4,452,775. It is noted that Applicants *also*

specifically teach that delivery systems *suitable for practicing the claimed invention* are found in the disclosure by Kent US 4,452,775:

> **Other implants useful in the method include biodegradable, metabolizable, cholesterol-based pellets that provide for slow release of bioactive substances.** Cholesterol-based implant matrices are commercially-available, for example, as 21, 60, and 90-day implants from Innovative Research, Saratoga, FL. **Other cholesterol-based 10 implants have been described for slow release of biotin and other micronutrients, and proteins, polynucleotides, polysaccharides, for example, U.S. Patent No.4,452,775 to Kent;** and U.S. Patent No.4,326,523 to Wolfrom. Also useful are implants having a peptide/polymer matrix, for example, tyrosine dipeptides and polymers as described in U.S. Patent No.4,863,735 to Kohn, and Kohn et al., J. Immunol. Methods 95:31-38, 15 (1986), that will degrade to form a product having adjuvant activity for the antigen or other bioactive compound incorporated into the matrix. (page 14, Instant specification, emphasis added)

Although Emery et al. did not specifically teach wherein the egg contained maternal antibodies to the antigen (in this case, a siderophore receptor protein (SRP)) , Emery et al. clearly implicitly provided the knowledge of sustained delivery of SRP's *in-ovo* prior to the Instantly claimed invention. It is deemed that the sustained matrices as disclosed by Kent were *capable of performing the limitation of* "wherein the implant provides for sustained release of the immunogen until the maternal antibodies in a bird hatching from the egg are reduced so that the bird is capable of mounting an immune response to the immunogen" as stated in claim 34.

While Emery et al. do not teach specifically that the egg contains a maternal antibody, this deficiency is cured by the combined teachings of the prior art, contrary to Applicants' assertions which are detailed *infra.*

To reiterate from the previous Office action, one of ordinary skill in the art would have had a reasonable expectation that inoculation of the egg with a siderophore receptor protein would have had a reasonable expectation of success, even though maternal antibodies toward the siderophore receptor protein were present in the egg. Applicant has not convincingly demonstrated that an immune response *will not be* elicited in an egg which has circulating maternal antibodies. Because Emery et al. was directed toward inoculation of an egg, one of ordinary skill in the art; for example, one who raises chickens for produce, would be motivated to inoculate *all* of the eggs of each successive generation of bird (or chicken or another avian species) according to well-known guidelines set forth in the prior art; i.e., Phelps et al. and Evans et al.. This flows naturally from the combined teachings of the prior art. Thus, once an egg has been inoculated it will more than likely have some maternal antibodies to the inoculated antigen. Regardless of the fact that the egg would or would not contain maternal antibodies toward the antigen, the ordinary artisan would have been motivated to further inoculate the eggs produced by this chicken which had been inoculated *in-ovo* because there would be a reasonable expectation that the inoculation would have afforded the unhatched bird *some immunity to the antigen*. Further, although the claims state that a maternal antibody must be present, there is no indication as to what amount the maternal antibodies must be present, and therefore, the claims could be directed toward as little as one antibody present in the egg. This is due to the fact that it is a guess as to when the vaccines should be given since *there is no verifiable means given in the*

Instant specification in order to quantify the antibody titers of the fertilized eggs, or to predict the amount of maternal antibodies in a given avian egg or to predict the maternal antibody titers in a hatched chick. Therefore, the Instant specification gives preferred protocols of when to inoculate the eggs, assuming that the maternal antibody titers are 'reduced' in the egg. However, this concept is deemed obvious because the prior art references clearly taught that the claimed times for inoculation of an avian as well as the particular protocol parameters found in the claims were well-known.

Applicants provide a brief synapses of Phelps et al. and assert:

> While this is a useful method of administering a variety of materials to an egg, and is in fact incorporated by reference in Applicants' specification, this reference does not teach or suggest providing sustained release of the immunogen until the maternal antibodies in a bird hatching from the egg are reduced so that the bird is capable of mounting an immune response to the immunogen (independent claim 1, see also independent claims 69 and 84) (p. 11, Remarks)

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Applicant also provides a brief synapse of the teachings of Genovese et al. and assert:

> Genovese et al. was first cited by the Examiner as evidence that the ordinary artisan would have recognized that the most crucial time of vaccination delivery to a young bird is within the first few days of life. Genovese et al. state vaccines can be used on newly hatched chicks and poults, but "maternal antibodies may cause interference with the vaccine and the desired immune response" (Genovese et al., page 5 of the Genovese et al. document included with the Office Action). Genovese et al. also state that "[o]ne to 7-day-old chicks and poults have been shown to be immunologically incompetent" (Genovese et al. at page 2 of the Genovese et al. document included with the Office Action), and admits that the lymphokines act "during the first 7 days of life in poultry when.., the immune response of these young birds is incompetent" (Genovese et al., page 5 of the Genovese et al. document included with the Office Action). "A prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention" (M.P.E.P §2141.02(VI)). Genovese et al. present several statements that vaccinating newly hatched chicks and poults may not result in an immune response. Thus, Genovese et al. cannot be used to support the proposition that delivery of vaccine to a young bird within the first few days of life is recognized to be a crucial time for vaccination…Furthermore, Genovese et al. do not administer anything to eggs, and the independent claims recite injecting a biocompatible implant into an egg. Genovese et al. inject the day old chicks, but not with an immunogen. Instead, the day old chicks are treated with lymphokines, which potentiate the innate immunity of poultry (Genovese et al., second paragraph of Introduction) (pp. 12-13, Remarks).

First, it is believed that Genovese et al. clearly teaches that immunization within the first few days of hatching is beneficial because, to reiterate, Genovese et al. states "... it would be advantageous to administer an agent which could potentiate an immediate immune response for protection during the 4 to 7 days when the birds are most susceptible to these bacterial invaders and vaccination responses have not yet taken full effect". Genovese et al. further state in the same paragraph that "poultry have been shown to be most susceptible to bacterial species such as Salmonella during the first 4 days of life". Further, Genovese et al. state that "vaccinations currently used on newly hatched chicks and poults do provide some levels of protection"(emphasis added). It is true that the chick's immune systems at this young age are 'incompetent'; however, it is clear from Genovese et al. that newly hatched

birds *do elicit an immune response when challenged with vaccines*. Wherein Applicants state: "Thus, Genovese et al. cannot be used to support the proposition that delivery of vaccine to a young bird within the first few days of life is recognized to be a crucial time for vaccination" is virtually immaterial to the Instantly claimed invention because this information as argued by Applicants is not actually claimed. The claims are broad enough to include any time period wherein the maternal antibodies are 'reduced' which is a very broad term, tending to be directed toward any time after hatching, or wherein the implant provides for a sustained or delayed release for a certain period of time such as 1-90 days or 1-60 days or 1-35 days as stated in the dependant claims. Clearly, *these times were within the preferred times of vaccination as taught by Genovese et al*. Again, the term 'reduced' in the claim is very broad and it is deemed that the times of inoculation as disclosed by Genovese et al. fit the description of 'reduced' maternal antibodies in light of the Instant specification, the Instant claims and especially absent evidence to the contrary.

Additionally, Applicants are reminded that the 'sustained' and 'delayed' release of the immunogen as related by the claimed invention takes place between 1-90, 1-60 or 1-35 days post-hatching. While Applicants tend to stress that this is a crucial period for immunization, it is plainly clear that the prior art already taught as such and thus, the times as Instantly claimed for delivering a siderophore receptor are not deemed inventive; on the contrary, the combined teachings of the prior art provide a clear roadmap to the claimed invention. The claimed invention is thus predictable

and one of ordinary skill in the art would have had a reasonable expectation of success based upon the combined teachings of the prior art.

In response to Applicants' contention that Genovese et al. 'teaches away' from the claimed invention: "Disclosed examples and preferred embodiments do not constitute a teaching away from a broader disclosure or non-preferred embodiments. *In re Susi*, 440 F.2d 442, 169 USPQ 423 (CCPA 1971). "A known or obvious composition does not become patentable simply because it has been described as somewhat inferior to some other product for the same use." *In re Gurley*, 27 F.3d 551, 554, 31 USPQ2d 1130, 1132 (Fed. Cir. 1994). In the Instant case, as described *supra*, Genovese et al. taught the advantageous use of immunization in birds during 4-7 days which is squarely within the claimed ranges of 'sustained' or 'delayed' release of the immunogen (e.g., 1-35 days post-hatching). Thus, it is not accepted that Genovese et al. 'teaches away' from the claimed invention; this is especially not accepted due to the statements provided by the Examiner *supra*, with regard to wherein Genovese et al. specifically teaches where preferably the inoculation of the bird takes place between 4 and 7 days.

Applicant argues:

"Sharma et al. was first cited by the Examiner as evidence that a bird's immune response is elicited even in the embryonic stage when vaccinated *in-ovo*. As argued in the response dated May 15, 2007, the eggs used by Sharma et al. did not include maternal antibody to the antigen administered in the vaccine"

Again, Applicant is respectfully misinterpreting the rejection as a whole and arguing that individual references such as Sharma et al. do not include particular limitations of the claimed rejection and thus the rejection must therefore be rendered obviated. This assessment by Applicants of the outstanding rejections is respectfully incorrect because taken as a whole, considering all of the references in combination, the Instantly claimed invention is deemed *prima facie* obvious.

Applicants argue:

> Sharma et al. teach the use of embryonal vaccination during the final quarter of incubation. Sharma et al. do not teach or suggest injecting a biocompatible implant into an egg, or providing sustained release of the immunogen until the maternal antibodies in a bird hatching from the egg are reduced so that the bird is capable of mounting an immune response to the immunogen (independent claim 1, see also independent claims 69 and 84). In fact, by stating that an embryo becomes immunologically competent in the final quarter of the incubation period (Sharma et al., col. 2, lines 58-64), Sharma et al. teach away from the need to use a biocompatible implant to result in sustained release of the immunogen until the maternal antibodies in a bird hatching from the egg are reduced so that the bird is capable of mounting an immune response to the immunogen (p. 13, Remarks).

Again, Applicants are arguing this reference as if it were the only reference present in the rejection, while in actuality, the rejection is made over the combination

of cited references. Where Applicants argue "In fact, by stating that an embryo becomes immunologically competent in the final quarter of the incubation period…Sharma et al. teach away from the need to use a biocompatable implant to result in sustained release of the immunogen"; however, this is not accepted. The teachings of Sharma et al. while indicating that an immune response may be elicited *in-ovo* do not verifiably teach away from the claimed invention, especially in light of the combination of the references which specifically teach the advantageous nature of immunizing a hatched bird squarely within the time frames as claimed by Applicants. Again, while Applicants as well as the prior art recognize that there is a point in time after the hatching of a bird that maternal antibodies decrease, thereby providing an advantageous window where an exceptional immune response can be elicited in a bird, Applicants have not disclosed such a window, as such a window would be vague and vary from bird to bird. While Applicants have provided data in the Instant specification which gives a rough estimate of when the maternal antibodies have decreased, claim 34 for example recites "wherein the implant provides for sustained release of the immunogen until the maternal antibodies in a bird hatching from the egg *are reduced so that the bird is* <u>*capable*</u> of mounting an immune response." First, no data has been provided which quantitates maternal antibody titers present *in an egg or in a hatched bird*. Again, the term 'reduced' is very broad, and it is not quite understood what this means. It is thus deemed that in light of the combined teachings of the prior art, that if an embryo is capable of enabling an immunogenic response to an antigen, then the maternal antibodies *must*

have been 'reduced' enough in order for the embryo to be 'capable of' mounting an immune response to the immunogen. Similarly, even though it was not the preferred embodiment of Genovese et al. , this reference clearly taught that immune responses were possible within 1-4 days of hatching. This also follows from *Applicants'' own claims which state that the immunogen is released from 1-n days* (where n=90 or 60 or 35). Thus, Applicants' arguments tend to contradict their own claimed invention.

Applicants argue "The skilled person would recognize that using a siderophore receptor protein in the poultry's fertilized eggs that contained maternal antibody to the siderophore receptor protein would probably not result in an immune response in the egg or in the bird hatching from the egg due to the presence of maternal antibodies " (pp. 13-14, Remarks). However, these contentions are respectfully traversed in light of the combined teachings of the prior art. Applicants' arguments do not flow naturally from what was known in the prior art and actually tend to contradict the state of the art. Emery et al. clearly taught *in-ovo* vaccination. Why would one of ordinary skill in the art, or someone of ordinary skill in the art practicing the invention such as a veterinarian in concert with a poultry farmer inoculate a batch of eggs *in-ovo* to protect against antigens and then never immunize another batch of eggs produced from those birds? The logic contemplated by Applicants' is respectfully found unreasonable, and out of sync with the teachings of the prior art. Clearly, the prior art has given sufficient evidence to indicate:

1) *In ovo* inoculation with SRP's was known and considered an advantageous vaccination means for inoculation of bird embryos;

2) *In ovo* inoculation with SRP's was specifically suggested to be carried out with sustained delivery agents such as delivery agents provided by Kent (see citation *supr*a) which would provide for the sustained release times as recited in the Instant claims,

3) Although maternal antibodies could potentially interfere with an immune response in a young, newly hatched bird, an immune response was nonetheless confirmed in birds *in-ovo* as well as newly hatched chicks,

4) A preferred time for inoculating birds was from 4-7 days, although many other times for inoculating birds have found to be successful in producing at least some immunity in the bird.

Considering the knowledge present in the prior art, it is deemed that Applicants' claimed invention is a *prima facie* obvious combination of what was already clearly presented by the above-cited prior art documents and is thus not deemed patentable.

Applicants argue:

> To establish a prima facie case of obviousness, there must also be a reasonable expectation of success. A reasonable expectation of success is highly correlated to the predictability of the field of endeavor. Applicants respectfully suggest that immunization can be a highly unpredictable art, and that this unpredictability is further increased by the complex interaction between maternal antibodies and the newborn birds immune systems. Applicants, in the Examples (p. 27 to 35 of the specification) have demonstrated that in ovo immunization can be successfully carried out and that immunization in hatched birds can successfully occur due to sustained release of immunogen. Applicants respectfully suggest that a reasonable expectation of success did not exist prior to Applicant's disclosure, and is not provided by the combination of Emery et. al with Phelps et al. (p. 14, Remarks).

Applicants' point out that "immunization can be a highly unpredictable art…increased by the complex interacting between maternal antibodies…" The breadth of Applicants' statements reaches far beyond the claimed invention. While it is accepted that the art of immunology is unpredictable *per se*; many procedures in immunology are well-known and well-understood, such as the process of the Instantly claimed invention. Applicants' arguments may have been persuasive if, for example, the antigen used in the claims was a novel antigen, or if the delivery system was novel and unobvious. However, in the Instant case, the prior art has provided ample indications in order to render the claimed invention obvious and *quite predictable*, because, again, contrary to Applicants' assertions:

1) In ovo inoculation with SRP's was known and considered an advantageous vaccination means for inoculation of bird embryos;

2) In ovo inoculation with SRP's was specifically suggested to be carried out with sustained delivery agents such as delivery agents provided by Kent (see citation

*supr*a) which would provide for the sustained release times as recited in the Instant claims;

3) Although maternal antibodies could potentially interfere with an immune response in a young, newly hatched bird, an immune response was nonetheless confirmed in birds *in-ovo* as well as newly hatched chicks, and

4) A preferred time for inoculating birds was from 4-7 days, although many other times for inoculating birds have found to be successful in producing at least some immunity in the bird.

While Applicants indicate that "…Examples (p. 27 to 35 of the specification) have demonstrated that in ovo immunization can be successfully carried out and that immunization in hatched birds can successfully occur due to sustained release of immunogen. Applicants respectfully suggest that a reasonable expectation of success did not exist prior to Applicant's disclosure, and is not provided by the combination of Emery et. al with Phelps et al. " (p. 14, Remarks). However, the Instant specification provides no evidence of any unexpected result; that is a result which would be above and beyond what was already expected in the prior art. Applicants have not provided any data with regard to *in -ovo* inoculations which were actually quantitated for antibody titers. Further, no 'critical' times for inoculation are found within the data as shown by Applicants because the specification teaches that the inoculations taking place with the antigen in combination with the sustained release formulations were simply performed

in order to ascertain the longevity of the implant in the bird or egg, but again, antibody titers were not performed. The Instantly claimed invention is thus *prima facie* predictable from the teachings of the combined prior art references contrary to Applicants' assertions.

Applicants argue:

> The Examiner's assertions regarding the reasonable expectation of success include asserting that the skilled person "would have had a reasonable expectation that inoculation of the egg with a siderophore receptor protein would have had a reasonable expectation of success, even though maternal antibodies toward the siderophore receptor protein were present in the egg" (Office Action, page 8, second paragraph), and "there would be a reasonable expectation that the inoculation would have afforded the unhatched bird some immunity to the antigen" (Office Action, page 9). Genovese et al. state that maternal antibodies may cause interference with the vaccine and the desired immune response, and none of the eggs used by Emery et al. or Sharma et al. included maternal antibodies to the administered antigen. The eggs used in the claimed methods include maternal antibody to the injected immunogen. The Examiner cannot assert that the skilled person had a reasonable expectation of success. For at least these reasons, the Office has failed to establish some predictability in any attempt to combine the cited documents to result in the present invention

These traversals were discussed previously in this Office action. While Applicants argue "..none of the eggs used by Emery et al. or Sharma et al. included maternal antibodies of the administered antigen. The eggs used in the claimed methods include material antibody to the injected immunogen…Examiner cannot assert that the skilled person had a reasonable expectation of success", these arguments are not accepted for the keen reasons provided *supra*. It is accepted that no prior art reference specifically taught the limitations of the claimed invention. If there was one reference which taught the Instantly claimed invention with sufficient specificity, a rejection would be properly made under the statute of 35 USC 102 and not 35 USC 103

as Instantly placed. Applicant again tends to traverse the concept that *in-ovo* inoculation would advantageously be carried out repeatedly in new eggs (over and over) in order to produce healthy birds. It is clearly determined from the prior art that *in-ovo* inoculation would occur over and over *and not just one time in one egg.* One of ordinary skill in the art would have been motivated to inoculate an egg and then an egg of the inoculated bird which had hatched from the original inoculated egg. The prior art provides implicit teachings of such even though they do not explicitly teach that an egg *in-ovo* contains maternal antibodies to a particular immunogen. Applicants' arguments tend to contradict the teachings of the prior art as a whole as indicating that *in-ovo* inoculation was wholly unsuccessful which is not accepted due to the clear teachings to the contrary as provided especially in view of Emery et al. Thus, the Examiner has provided clear indication of a *prima facie* case of obviousness."[a] person of ordinary skill is also a person of ordinary creativity, not an automaton *KSR* 127S. Ct. at 1742.

Applicants argue:

> The recent Supreme Court decision KSR International Co. v. Teleflex Inc., 82 USPQ2d 1385 (U.S. 2007) was cited by the Examiner to support the proposition that the elements of the claims were known, and were rendered obvious in view of known methods regarding poultry inoculation. The invention in KSR was in the mechanical arts, which is often characterized by the Office as a predictable art. In contrast, the present invention can be considered to be in the biotechnological arts, which is often characterized by the Office as an unpredictable art. The claimed invention is not a predictable variation of the techniques presented in the cited documents. For instance, as discussed hereinbefore, immunization can be a highly unpredictable art

Again, it is reiterated that while Applicants continue to argue that the cart of immunology is unpredictable, which is accepted by the Examiner in-part, *the Instantly claimed invention is quite predictable based upon the teachings of the prior art*. It cannot be seen where Applicants' claimed invention has risen above the plain teachings of the combined prior art references which collectively indicate that *in-ovo* inoculation with SRP's was advantageous and could be carried out within the time frames as Instantly claimed with carriers which were sufficient for providing a sustained/delayed release (e.g., carriers disclosed by Kent) and that sustained release until a time as Instantly claimed would be advantageous; such as between 4 and 7 days because maternal antibodies would be less-likely to interfere during this time frame. [If]… there are [a] finite number of identified, predictable solutions, [a] person of ordinary skill in art has good reason to pursue known options within his or her technical grasp, and if this leads to anticipated success, it is likely product of ordinary skill and common sense, not innovation *KSR International Co. v. Teleflex Inc.*, 82 USPQ2d 1385 U.S. 2007.

From the teachings of the references, it is apparent that one of ordinary skill in the art would have had a reasonable expectation of success in producing the claimed invention. Therefore, the invention as a whole was *prima facie* obvious to one of ordinary skill in the art at the time the invention was made, as evidenced by the references, especially in the absence of evidence to the contrary.

Conclusion

No claims are allowed.

This is an RCE of applicant's earlier Application No. 10/749,602. All claims are drawn to the same invention claimed in the earlier application and could have been finally rejected on the grounds and art of record in the next Office action if they had been entered in the earlier application. Accordingly, **THIS ACTION IS MADE FINAL** even though it is a first action in this case. See MPEP § 706.07(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no, however, event will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patricia Leith whose telephone number is (571) 272-0968. The examiner can normally be reached on Monday - Friday 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terry McKelvey can be reached on (571) 272-0775. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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